Analytical Chemistry Laboratory

Analytical Services and Research

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Analytical Chemistry Laboratory

- **A full-cost-recovery service center, with the primary mission of providing a broad range of analytical chemistry support services to the scientific and engineering programs at Argonne National Laboratory.**
- Also provides specialized analytical services for governmental, educational, and industrial organizations.
- Conducts research programs in analytical chemistry and works on instrumental and methods development.
- Handles a wide range of analytical problems, from routine standard analyses to unique problems that require significant development of methods and techniques.
- A sample receiving system is in place to efficiently process samples requiring chain-of-custody tracking.
- A quality assurance program is maintained to produce data packages that meet the rigorous requirements of EPA, DOE and other programs.
- The Analytical Chemistry Laboratory is certified by the State of Utah.

Inorganic Analysis

Wet-chemical and instrumental methods for elemental, compositional and isotopic analysis of solid, liquid and gaseous samples

Ion Chromatograph (IC)
Inductively Coupled Plasma/Atomic Emission Spectroscopy (ICP/AES)
Inductively Coupled Plasma/Mass Spectroscopy (ICP/MS)
Thermal Ionization Mass Spectrometry (TIMS)
Carbon, Sulfur, Oxygen, Nitrogen Analyzers
Autotitrator
Cold Vapor Atomic Adsorption Mercury Analyzer

Organic Analysis

Complementary techniques for separation and quantitative analysis of trace-level complex organic mixtures and compounds

Gas Chromatograph/Mass Spectrometers (GC/MS)
Supercritical Fluid Extraction Apparatus
Fourier Transform Infrared Microscope with Raman Spectrometer

Radiochemical Analysis

Nuclear counting techniques over a wide range of sample types, from low-radioactivity environmental samples to samples with high radioactivity requiring containment

Gamma Spectrometry
Alpha Spectrometry
Gross Alpha and Beta Analysis
Liquid Scintillation Analysis
Inorganic Analysis of Radioactive Materials Via ICP/AES or IC

Microscopy

Providing analysis of microstructure and composition of a wide variety of materials

X-ray Diffractometer
Scanning Electron Microscopy (SEM)
Transmission Electron Microscopy (TEM)
SEM User Facility

Recent Projects

- Isotopic Analysis of High-Burnup Spent Nuclear Fuel
  - Providing data to benchmark codes for predicting nuclide inventories and fuel properties
- Use of the ORIGEN2 Code to Determine Isobaric Compositions in the Analysis of Spent Fuel by ICP-MS
  - Measuring concentrations for all of the elements from atomic number 38 through 96
- ICP-OES Method for Material Accountancy Measurements
  - Exploratory research on actinide accountancy measurements
- Application of MARLAP to Validation and Verification of Existing Data
  - Radiological data analysis for site cleanup
- Distribution Coefficients Measurements of Radionuclides in Soils
  - Determining transport characteristics of site specific soils
- Analysis of Simulated Headspace Gases for the Waste Isolation Pilot Plant (WIPP)
  - Helping the Nation to permanently dispose TRU waste
- Plutonium Metal Exchange Program
  - Checks and balances in measuring plutonium
- Tritium Target Qualification Project
  - Helping the Nation to produce tritium
- Switchable Neutron Source Development
  - Neutron sources for the Space Program

Free Services

- Estimates and Planning – Save time and money by working with ACL before submitting a sample
- Discussions of Methods and Instrumental Capabilities
- Collaborative Work on Proposals and Marketing
  - Estimates for Proposals
  - Assistance in selling projects requiring ACL work, including laboratory tours for sponsors

Contact Information

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